Abstract of the Disclosure

A data recording disk drive has damping plates with nonplanar surfaces for reducing flow-induced, out-of-plane vibration of the disks. The nonplanar damping plates reduce spindle motor torque, as compared with planar damping plates, while reducing the turbulent intensity. Each damping plate has a nonplanar surface that results in spacing between the plate surface and its associated disk surface that varies in the radial direction. The nonplanar surface may be a pattern of surface irregularities or features that may be arranged in concentric patterns, such as a pattern of concentric grooves, depressions or protuberances. The nonplanar surface may be shaped as a section of a conic surface so that in the radial direction the spacing between the damping plate surface and its associated disk surface varies linearly. For the disk surfaces facing the top and bottom of the disk housing, the nonplanar surfaces are applied to the top and bottom of the disk housing. Thus, in the single disk case, no separate damping plate is needed.